



From Detection to Decision: Leveraging Advanced Technologies to Optimize System Performance

FROM DETECTION TO DECISION

COLLECTIONS

Inside the sewer system

Pipe and manhole data reveal where to investigate, clean, or rehabilitate.



Collection systems are being asked to do more with less.

Aging assets

Pipes, manholes and service connections are reaching the age where history alone is no longer enough.

Limited capacity

Crews cannot clean and inspect everything at the same frequency forever. Budgets are real; magic wands remain backordered.

Higher accountability

Utilities need decisions that are documented, repeatable and defensible.

The challenge is not simply finding defects. It is deciding what deserves attention first.

That is where a layered assessment strategy earns its keep.

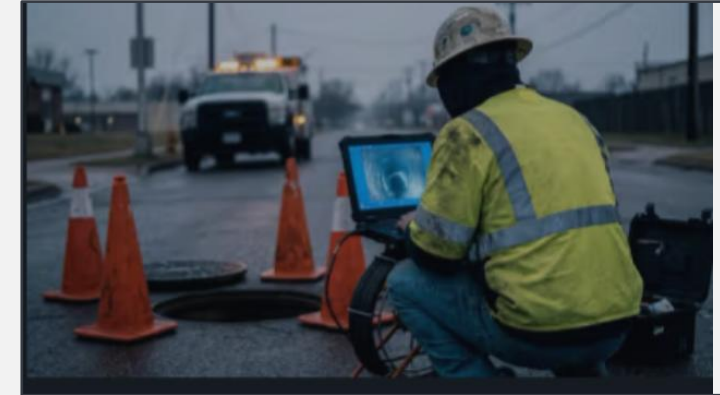


We can't CCTV our way out of every problem.

Full-system CCTV has value — but using it as the first filter can burn budget before it creates useful priority.

Better question:

Which assets actually need our attention?



Traditional

Clean → CCTV → review → repeat

Problem

High cost, crew time and too much low-value video

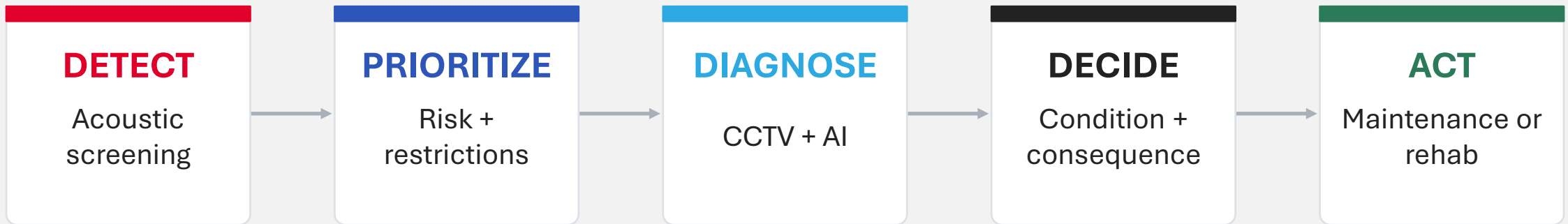
Shift

Screen first, then investigate selectively



A decision architecture — not a collection of gadgets.

Each technology has a job. The power comes from connecting the layers.



Each layer should answer a specific question before you pay for the next layer.

SL-RAT

Detect | Start broad with acoustic screening.

Rapidly screen gravity sewer to identify likely restrictions before committing to cleaning or CCTV.



FAST

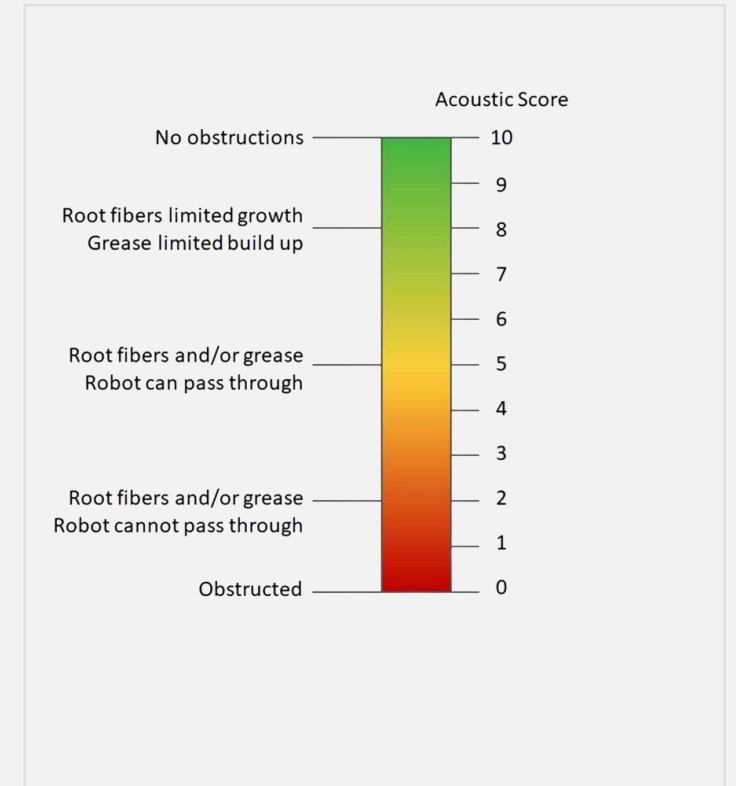
Screen large portions of system

OBJECTIVE

Consistent 0–10 assessment scale

ACTIONABLE

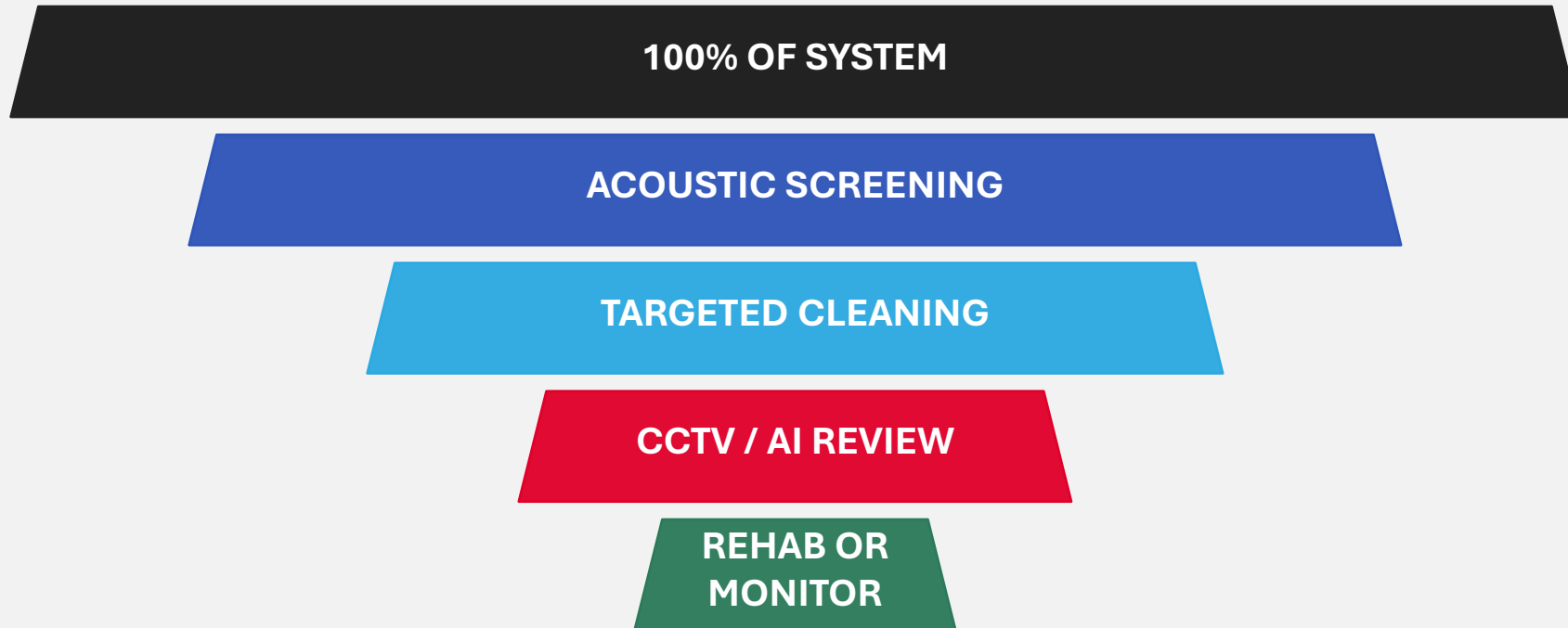
Prioritize lines requiring attention



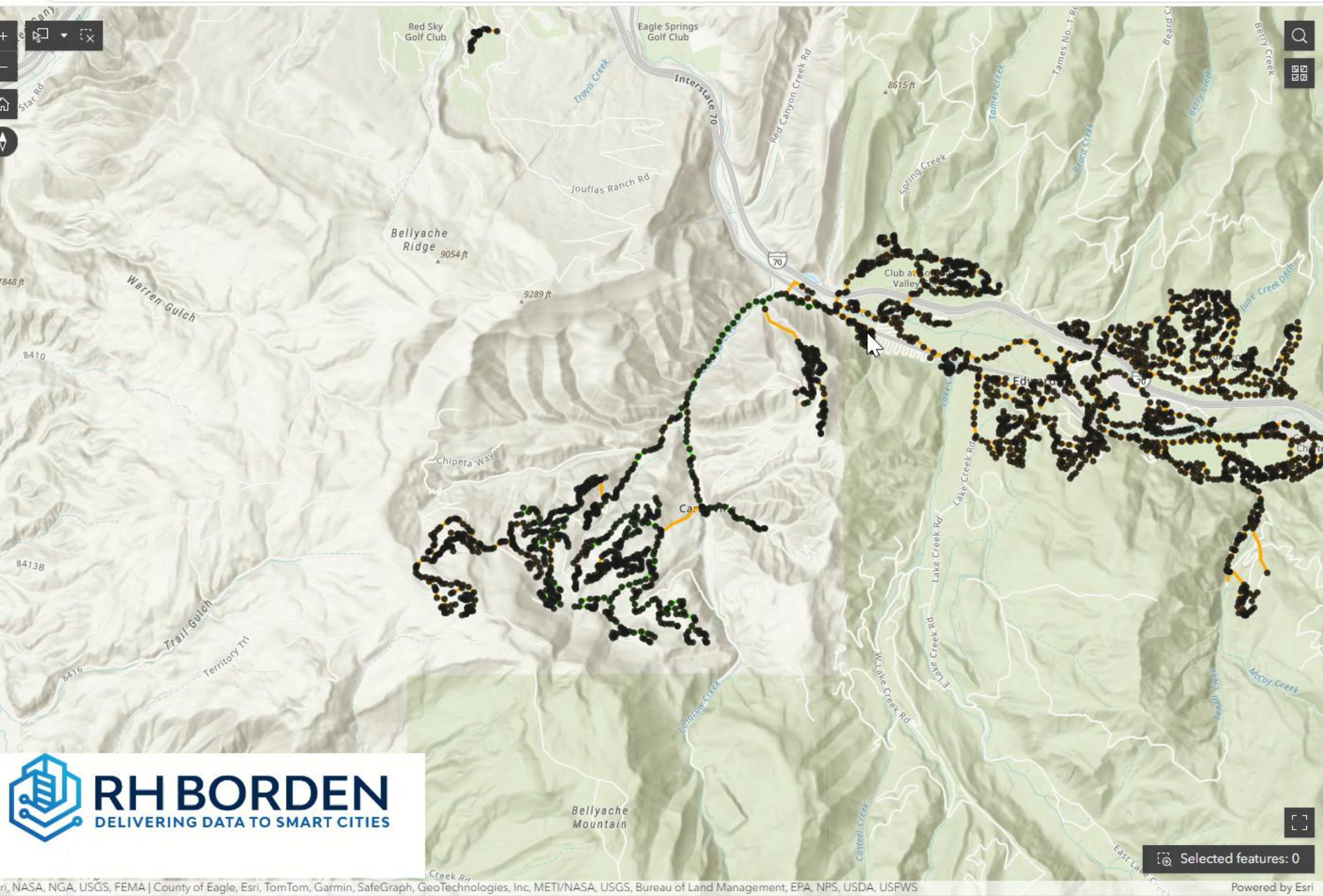
Use SL-RAT as the first filter — not the final diagnosis.

Prioritize | Not every pipe needs the truck.

Use low-cost screening to narrow where higher-cost activities create real value.



The expensive steps should be applied after the data gives you a reason.



☒ All Manholes

☒ All Sewer Lines

☐ Urgent Situation

☐ MVM - Manhole Virtual Model

☐ Collar Condition

☐ Cover/Frame Condition

☐ Structure Condition

☐ Bench/Channel Condition

☐ Infiltration

Sewer Line - Rating

Sewer Line - Score

MVM - Manhole Virtual Model

Collar Condition

Cover/Frame Condition

Structure Condition

SL-RAT Rating

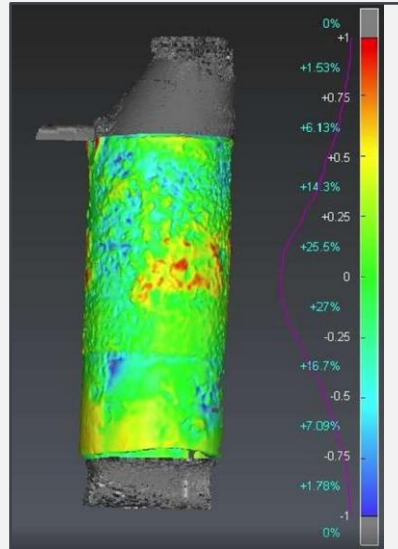
MVM Wall Rating

Selected features: 0

Powered by Esri

Don't stop at the pipe.

What is a manhole / wet well virtual model?



Digital baseline

Create a record of the full manhole structure.

Virtual entry

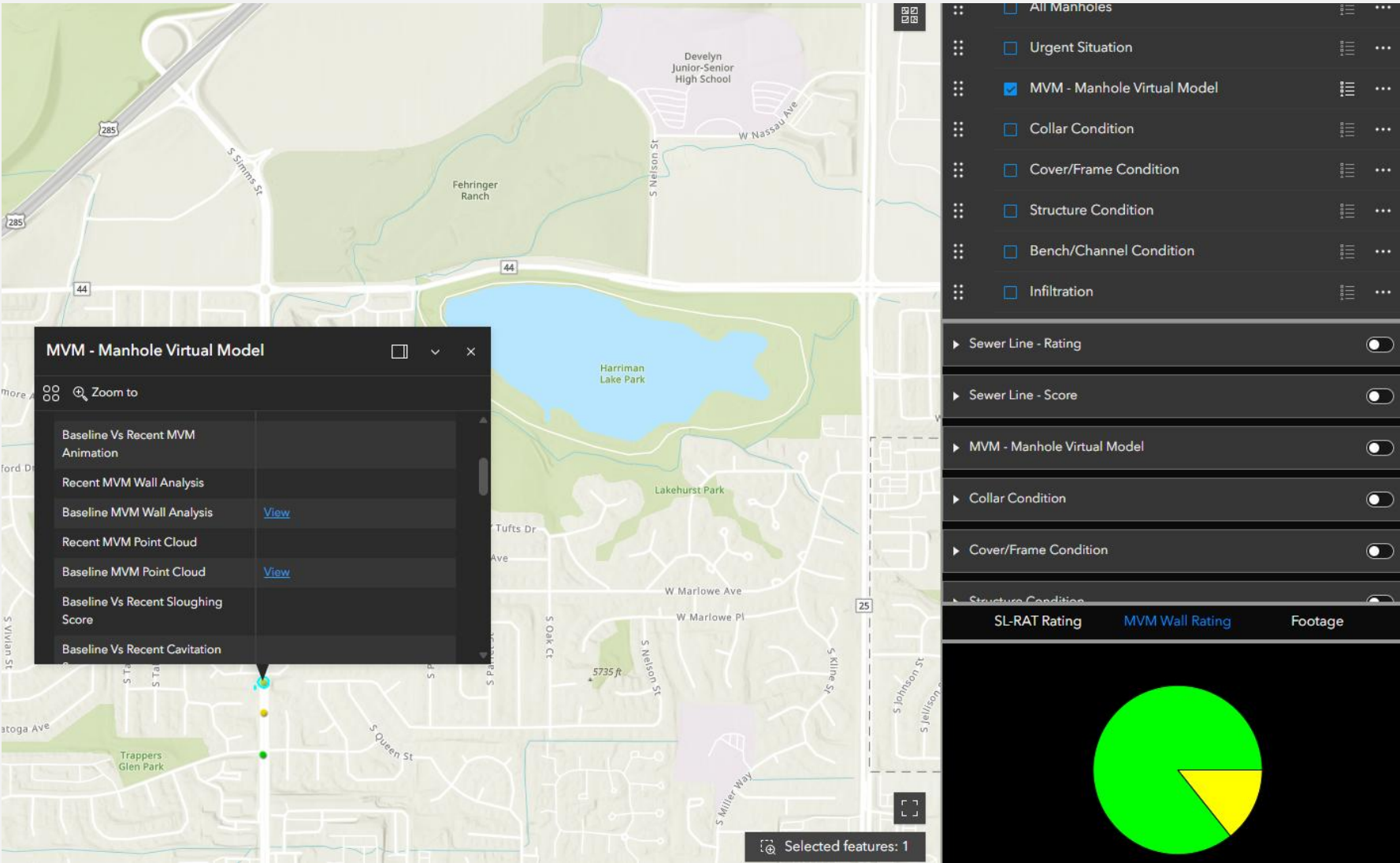
Reduce return trips and revisit conditions from the desktop.

Trend condition

Monitor degradation and prioritize vertical assets.

Turn manholes & wet wells into measurable, repeatable data - not just field notes.

Digitally track your system

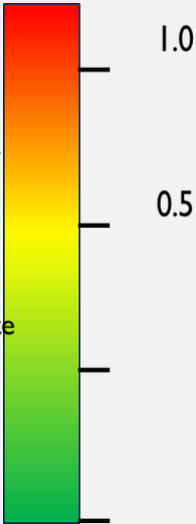


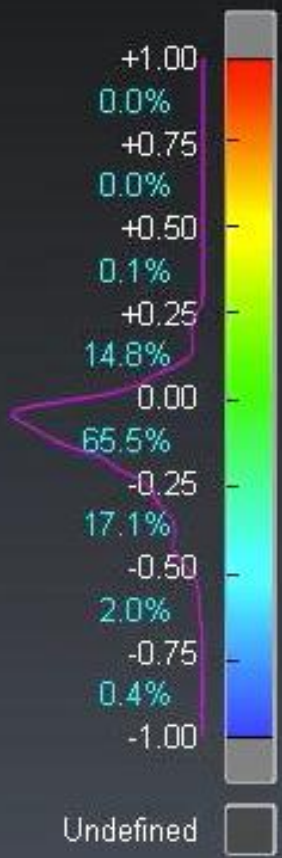
MVM Wall Score

NEEDS REVIEW
Signs of degradation / buildup
that require additional review

FAIR
Moderate signs of deviation
from original installation state

GOOD
Little to no sign of
degradation or buildup





Unit: in



0:20 / 0:20

▶

⏮ ⏪ ⏩ ⏭ 🔍

🔊 🔍 2 ft 🔍

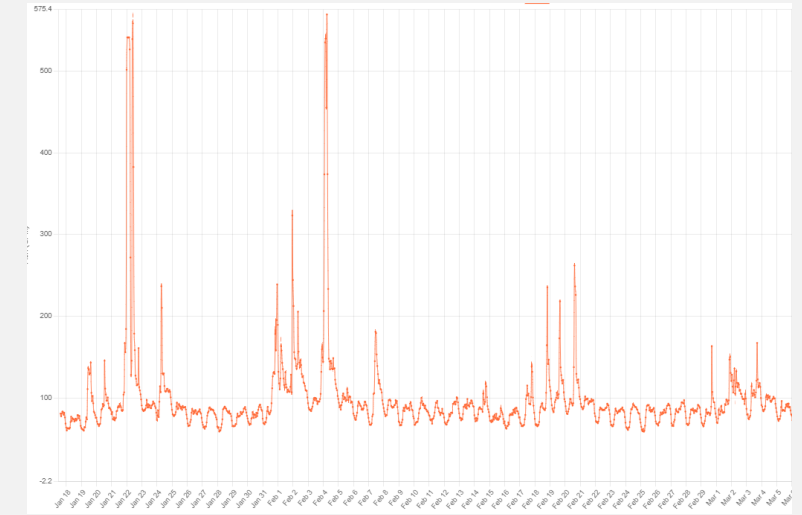
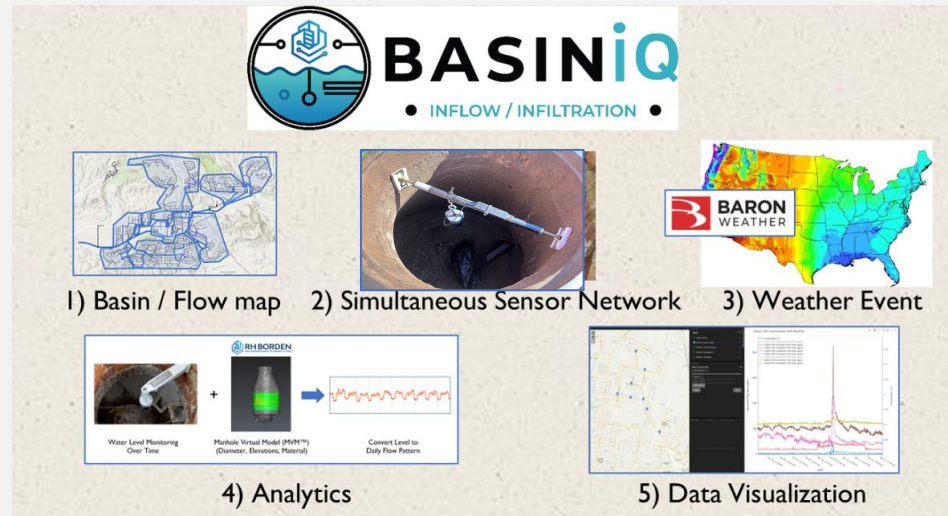
Drag to look around · Scroll to zoom

Download video



I&I | Connect the evidence.

A defect tells us what is wrong. Data helps tell us why it matters.



MVM + BasiniQ + Rainfall + GIS

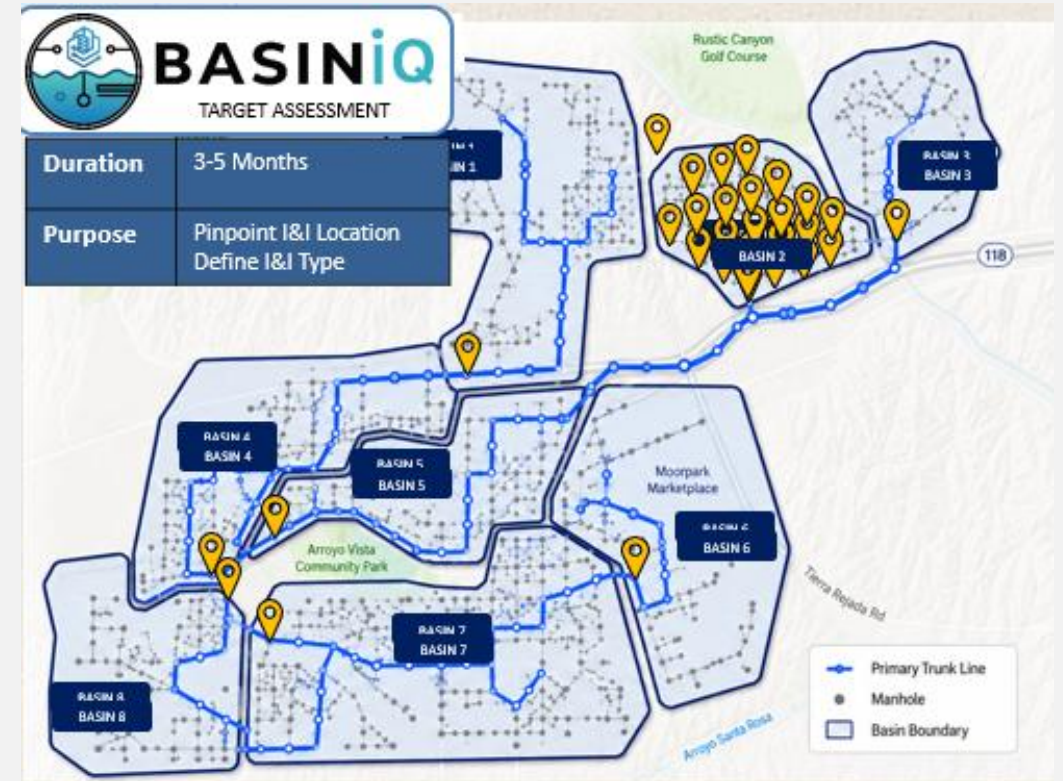
Together, these layers turn “we have excess flow” into “here is the basin, asset, condition and likely source.”

Go from basin to source.

Start with system behavior, then narrow to the assets that are driving the response.



MAJOR BASIN

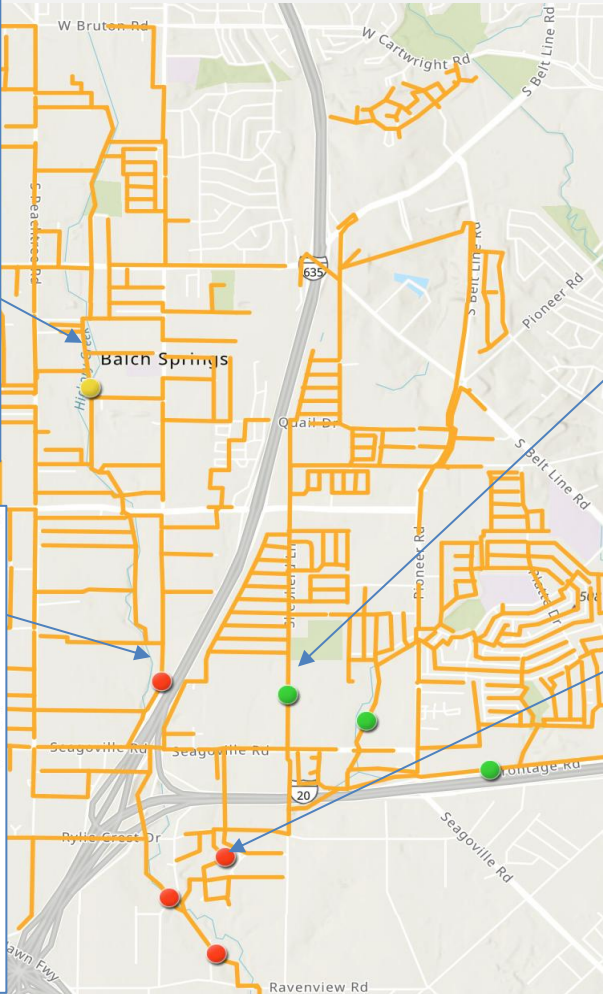
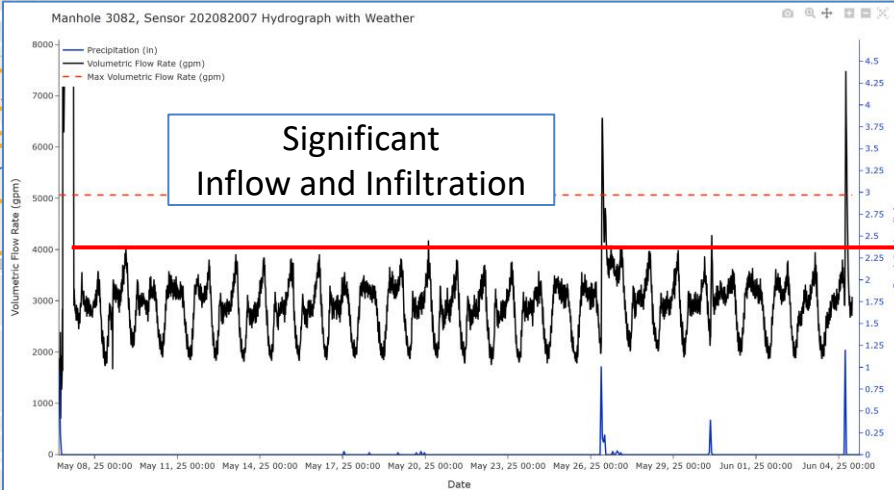
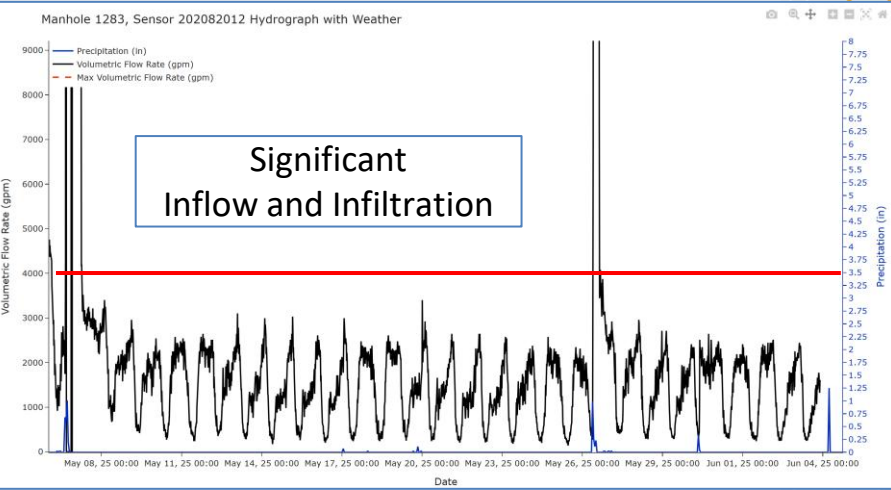
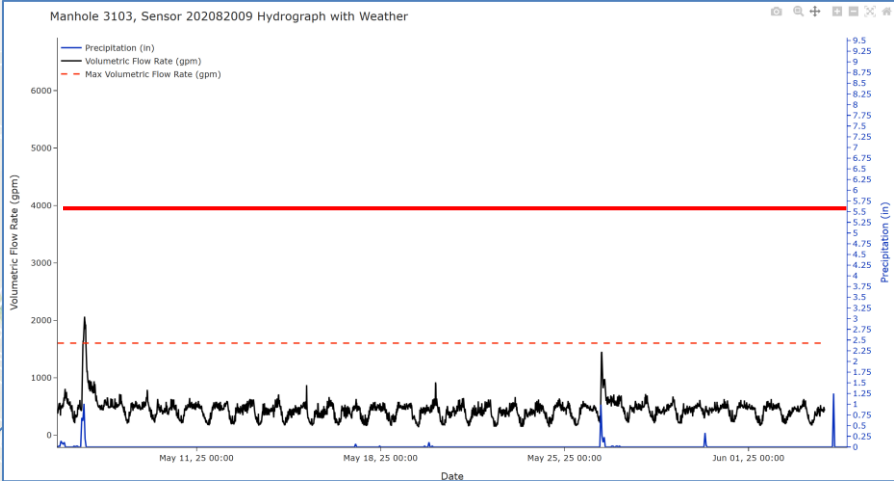
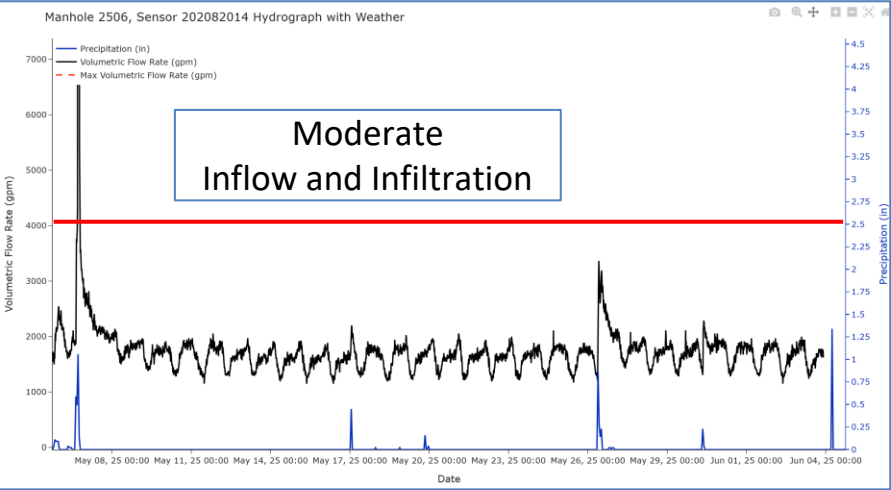


TARGET BASIN

Placing the level sensor.



Major basin assessment summary.



423 sensors. 70 miles. One big ROI.

Assessment Tool	BASINiQ	Traditional Methods CCTV • Smoke Testing • L1 MH Inspection
Total Investment	\$540K	\$1.1M
Time to Complete Assessment	4 Months	5–10 Years
Yield	85% of I&I locations / sources identified	20–25% of I&I locations / sources identified
Ongoing Effectiveness	✓ Yes	— No

Rehabilitation is the outcome — not the starting point.

The right repair method should come from the evidence, not from a one-size-fits-all program.



MAINTAIN

Jet / clean / monitor



LOCAL

TRENCHLESS

CIPP / UV-GRP lining



REHABILITATION

Spot repair /
manhole rehab

Data should determine whether we clean it, monitor it, rehab it, or replace it.

Three things to take home.

01 — Screen before you spend

Use rapid assessment to determine where detailed inspection is justified.

02 — Connect the data

Pipe condition, manhole condition, flow, rainfall and GIS tell a stronger story together.

03 — Let the data drive the action

Maintenance, monitoring, rehabilitation and replacement should be outcomes of the assessment process.



The goal is not to inspect more infrastructure. It is to make better decisions about the infrastructure you already have.

FROM DETECTION TO DECISION

DISTRIBUTION

Finding hidden water loss

Flow patterns and acoustic evidence narrow the search before crews confirm a leak.

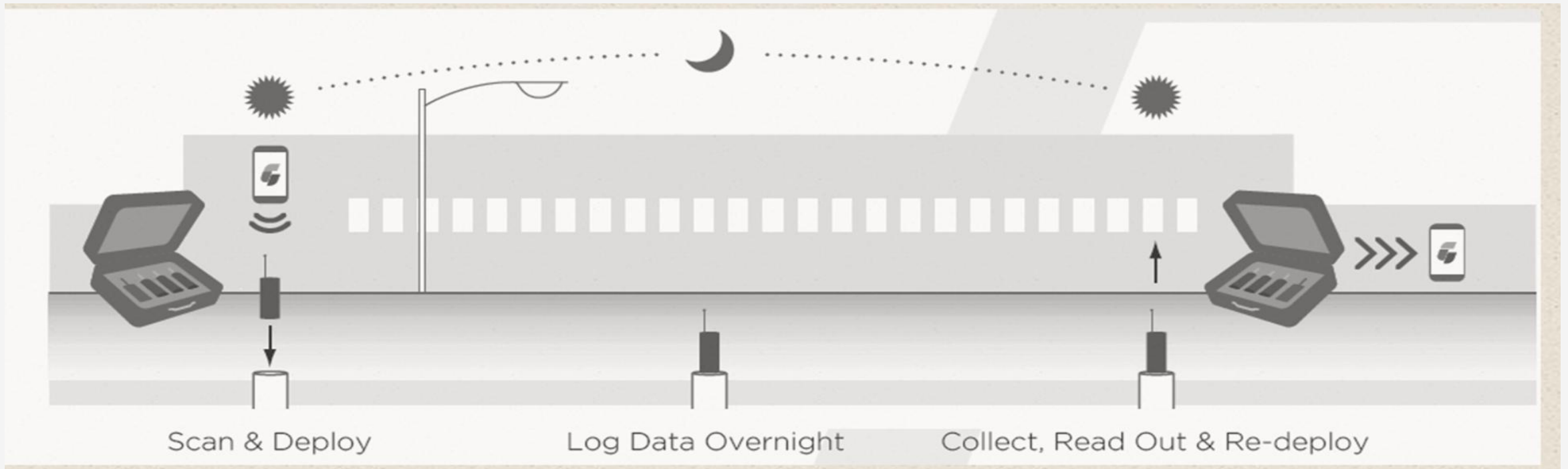


CECTI • From Detection to Decision



Survey the system before a leak announces itself.

Deploy loggers across the network to flag areas that warrant a closer listen.



TARGETED FOLLOW-UP

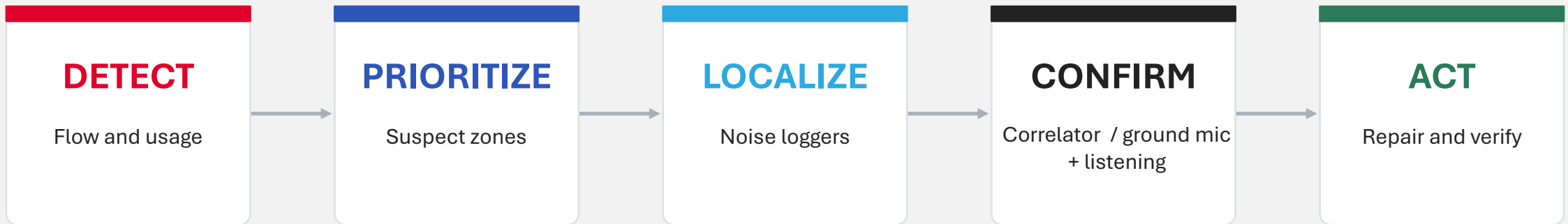
Correlators and ground microphones pinpoint flagged areas.

ACT

Prioritize repairs, verify the result, and document the finding.

From detection to a repair decision.

Start with system signals, then spend field time where a leak is most likely.



Every step narrows the search and gives the crew a reason for the next step.

What tells us where to listen?

Follow the evidence from system data to field confirmation.

FLOW + USAGE

Unexpected demand or minimum night flow points to a search area.

OVERNIGHT LOGGERS

Compare noise at accessible points when background activity is lower.

ON-SITE CHECK

Correlate and listen where the signals converge.



THE FIELD DECISION

A smaller area for targeted correlation and listening.

A logger alert is a lead, not an excavation mark.

CLOSING

Three things to take home.

01

SCREEN BEFORE IT SHOWS

Systemwide loggers can flag hidden leaks before they appear at the surface.

02

NARROW THE SIGNAL

Correlators and ground microphones help pinpoint the areas the loggers flag.

03

ACT, THEN VERIFY

Prioritize the repair, then check the system to confirm the result.

Find hidden leaks early. Make the repair decision with confidence.



THANK YOU!

Jennifer Jackse

jjackse@ironwomancon.com

(720) 822-8542

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